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=> d his

     (FILE 'HOME' ENTERED AT 14:45:53 ON 01 OCT 2002)

     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
     LIFESCI' ENTERED AT 14:46:13 ON 01 OCT 2002
L1             0 S GLYCOSUL (A)TRANSFERASE###
L2          2430 S GLYCOSYL (A)TRANSFERASE###
L3         45237 S GST###
L4         47661 S L2 OR L3
L5         20775 S (HUMAN OR MURINE ) AND L4
L6       5615033 S CLON? OR EXPRESS? OR RECOMBINANT
L7         11204 S L5 AND L6
L8          1697 S (HUMAN OR MURINE ) (A) L4
L9           845 S L8 AND L6
L10            0 S GST4(2W)ALPHA
L11      3576367 S ALPHA
L12          296 S L9 AND L11
L13           49 S "GST4"
L14            0 S "GST4ALPHA"
L15            8 S L13 AND L12
L16            2 DUP REM L15 (6 DUPLICATES REMOVED)
L17           18 DUP REM L13 (31 DUPLICATES REMOVED)
                 E ROSEN S/AU
L18         2288 S E3
L19            0 S L5 AND L18
                 E LEE J K L/AU
                 E LEE J K /AU
L20         3333 S E3
L21           17 S L5 AND L20
L22            6 DUP REM L21 (11 DUPLICATES REMOVED)
                 E HEMMERICH S/AU
L23          113 S E3
L24           15 S L5 AND L23
L25            6 DUP REM L24 (9 DUPLICATES REMOVED)
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* * * * * * * * * *   Welcome to STN International   * * * * * * * * * *

 NEWS  1           Web Page URLs for STN Seminar Schedule - N. America
 NEWS  2  Apr 08   "Ask CAS" for self-help around the clock
 NEWS  3  Apr 09   BEILSTEIN: Reload and Implementation of a New Subject Area
 NEWS  4  Apr 09   ZDB will be removed from STN
 NEWS  5  Apr 19   US Patent Applications available in IFICDB, IFIPAT, and IFIUDB
 NEWS  6  Apr 22   Records from IP.com available in CAPLUS, HCAPLUS, and ZCAPLUS
 NEWS  7  Apr 22   BIOSIS Gene Names now available in TOXCENTER
 NEWS  8  Apr 22   Federal Research in Progress (FEDRIP) now available
 NEWS  9  Jun 03   New e-mail delivery for search results now available
 NEWS 10  Jun 10   MEDLINE Reload
 NEWS 11  Jun 10   PCTFULL has been reloaded
 NEWS 12  Jul 02   FOREGE no longer contains STANDARDS file segment
 NEWS 13  Jul 22   USAN to be reloaded July 28, 2002;
                   saved answer sets no longer valid
 NEWS 14  Jul 29   Enhanced polymer searching in REGISTRY
 NEWS 15  Jul 30   NETFIRST to be removed from STN
 NEWS 16  Aug 08   CANCERLIT reload
 NEWS 17  Aug 08   PHARMAMarketLetter(PHARMAML) - new on STN
 NEWS 18  Aug 08   NTIS has been reloaded and enhanced
 NEWS 19  Aug 19   Aquatic Toxicity Information Retrieval (AQUIRE)
                   now available on STN
 NEWS 20  Aug 19   IFIPAT, IFICDB, and IFIUDB have been reloaded
 NEWS 21  Aug 19   The MEDLINE file segment of TOXCENTER has been reloaded
 NEWS 22  Aug 26   Sequence searching in REGISTRY enhanced
 NEWS 23  Sep 03   JAPIO has been reloaded and enhanced
 NEWS 24  Sep 16   Experimental properties added to the REGISTRY file
 NEWS 25  Sep 16   Indexing added to some pre-1967 records in CA/CAPLUS
 NEWS 26  Sep 16   CA Section Thesaurus available in CAPLUS and CA

 NEWS EXPRESS  February 1 CURRENT WINDOWS VERSION IS V6.0d,
               CURRENT MACINTOSH VERSION IS V6.0a(ENG) AND V6.0Ja(JP),
               AND CURRENT DISCOVER FILE IS DATED 05 FEBRUARY 2002
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FILE 'HOME' ENTERED AT 14:45:53 ON 01 OCT 2002

=> file medline embase biosis biotechds scisearch hcaplus ntis lifesci
COST IN U.S. DOLLARS                                SINCE FILE      TOTAL
                                                       ENTRY    SESSION
FULL ESTIMATED COST                                     0.21       0.21

FILE 'MEDLINE' ENTERED AT 14:46:13 ON 01 OCT 2002
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=> s glycosul (a)transferase ###
ADDITIONAL CHARACTERS REQUIRED AFTER '###' FOR LEFT TRUNCATION
ADDITIONAL CHARACTERS REQUIRED AFTER '###' FOR LEFT TRUNCATION
ADDITIONAL CHARACTERS REQUIRED AFTER '###' FOR LEFT TRUNCATION
LEFT TRUNCATION IGNORED FOR '###' FOR FILE 'BIOTECHDS'
ADDITIONAL CHARACTERS REQUIRED AFTER '###' FOR LEFT TRUNCATION
ADDITIONAL CHARACTERS REQUIRED AFTER '###' FOR LEFT TRUNCATION
LEFT TRUNCATION IGNORED FOR '###' FOR FILE 'NTIS'
LEFT TRUNCATION IGNORED FOR '###' FOR FILE 'LIFESCI'
Left truncation is not valid in the specified search field in the
specified file. The term has been searched without left truncation.
Examples: '?TERPEN?' would be searched as 'TERPEN?' and '?FLAVONOID'
would be searched as 'FLAVONOID.'

If you are searching in a field that uses implied proximity, and you
used a truncation symbol after a punctuation mark, the system may
interpret the truncation symbol as being at the beginning of a term.
Implied proximity is used in search fields indexed as single words,
for example, the Basic Index.

=> s glycosul (a)transferase###
L1 0 GLYCOSUL (A) TRANSFERASE###

=>
<------User Break------>

=> s glycosyl (a)transferase###
L2 2430 GLYCOSYL (A) TRANSFERASE###

=> s GST###
L3 45237 GST###

=> s l2 or l3
L4 47661 L2 OR L3

=> s (human or murine) and l4
3 FILES SEARCHED...
L5 20775 (HUMAN OR MURINE) AND L4

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=> s clon? or express? or recombinant
   3 FILES SEARCHED...
L6     5615033 CLON? OR EXPRESS? OR RECOMBINANT

=> s l5 and l6
L7       11204 L5 AND L6

=> s (human or murine ) (a) l4
   3 FILES SEARCHED...
L8        1697 (HUMAN OR MURINE ) (A) L4

=> s l8 and l6
L9         845 L8 AND L6

=> s GST4(2w)alpha
L10          0 GST4(2W) ALPHA

=> s alpha
L11    3576367 ALPHA

=> s l9 and l11
L12        296 L9 AND L11

=> s "GST4"
L13         49 "GST4"

=> s "GST4alpha"
L14          0 "GST4ALPHA"

=> s l13 and l12
L15          8 L13 AND L12

=> dup rem l15
PROCESSING COMPLETED FOR L15
L16          2 DUP REM L15 (6 DUPLICATES REMOVED)

=> d 1-2 ibib ab

L16  ANSWER 1 OF 2     MEDLINE                              DUPLICATE 1
ACCESSION NUMBER:   2001205848     MEDLINE
DOCUMENT NUMBER:    21096027   PubMed ID: 11181564
TITLE:              Chromosomal localization and genomic organization for the
                    galactose/ N-acetylgalactosamine/N-acetylglucosamine
                    6-O-sulfotransferase gene family.
AUTHOR:             Hemmerich S; Lee J K; Bhakta S; Bistrup A; Ruddle N R;
                    Rosen S D
CORPORATE SOURCE:   Department of Respiratory Diseases, Roche Bioscience, Palo
                    Alto, CA 94304, USA.
CONTRACT NUMBER:    RO1GM5741 (NIGMS)
SOURCE:             GLYCOBIOLOGY, (2001 Jan) 11 (1) 75-87.
                    Journal code: 9104124. ISSN: 0959-6658.
PUB. COUNTRY:       England: United Kingdom
DOCUMENT TYPE:      Journal; Article; (JOURNAL ARTICLE)
LANGUAGE:           English
FILE SEGMENT:       Priority Journals
OTHER SOURCE:       GENBANK-AF176838; GENBANK-AF280086; GENBANK-AF280087;
                    GENBANK-AF280088; GENBANK-AF280089; GENBANK-AI824100
ENTRY MONTH:        200106
ENTRY DATE:         Entered STN: 20010611
                    Last Updated on STN: 20010611
                    Entered Medline: 20010607
AB   The galactose/N-acetylgalactosamine/N-acetylglucosamine
     6-O-sulfotransferases (GSTs) are a family of Golgi-resident enzymes that
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transfer sulfate from 3'phosphoadenosine 5'phospho-sulfate to the 6-hydroxyl group of galactose, N-acetylgalactosamine, or N-acetylglucosamine in nascent glycoproteins. These sulfation modifications are functionally important in settings as diverse as cartilage structure and lymphocyte homing. To date six members of this gene family have been described in human and in mouse. We have determined the chromosomal localization of these genes as well as their genomic organization. While the broadly **expressed** enzymes implicated in proteoglycan biosynthesis are located on different chromosomes, the highly tissue specific enzymes GST-3 and 4 are encoded by genes located both in band q23.1--23.2 on chromosome 16. In the mouse, both genes reside in the syntenic region 8E1 on chromosome 8. This cross-species conserved clustering is suggestive of related functional roles for these genes. The **human GST4** locus actually contains two highly similar open reading frames (ORF) that are 50 kb apart and encode two highly similar enzyme isoforms termed GST-4 **alpha** and GST-4 beta. All genes except GST0 (chondroitin 6-O-sulfotransferase) contain intron-less ORFs. With one exception these are fused directly to sequences encoding the 3' untranslated regions (UTR) of the respective mature mRNAs. The 5' UTRs of these mRNAs are usually encoded by a number of short exons 5' of the respective ORF. 5'UTRs of the same enzyme **expressed** in different cell types are sometimes derived from different exons located upstream of the ORF. The genomic organization of the GSTs resembles that of certain glycosyltransferase gene families.

L16 ANSWER 2 OF 2 MEDLINE DUPLICATE 2
ACCESSION NUMBER: 91119426 MEDLINE
DOCUMENT NUMBER: 91119426 PubMed ID: 1846734
TITLE: Purification and characterization of human muscle glutathione S-transferases: evidence that glutathione S-transferase zeta corresponds to a locus distinct from GST1, GST2, and GST3.
AUTHOR: Singhal S S; Ahmad H; Sharma R; Gupta S; Haque A K; Awasthi Y C
CORPORATE SOURCE: Department of Human Biological Chemistry & Genetics, University of Texas Medical Branch, Galveston 77550.
CONTRACT NUMBER: CA-27967 (NCI)
EY-04396 (NEI)
GM-32304 (NIGMS)
SOURCE: ARCHIVES OF BIOCHEMISTRY AND BIOPHYSICS, (1991 Feb 15) 285 (1) 64-73.
Journal code: 0372430. ISSN: 0003-9861.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199103
ENTRY DATE: Entered STN: 19910329
Last Updated on STN: 19980206
Entered Medline: 19910306

AB Human muscle glutathione S-transferase isozyme, GST zeta (pI 5.2) has been purified by three different methods using immunoaffinity chromatography, DEAE cellulose chromatography, and isoelectric focusing. GST zeta prepared by any of the three methods does not recognize antibodies raised against the **alpha**, mu, or pi class glutathione S-transferases of human tissues. GST zeta has a blocked N-terminus and its peptide fingerprints also indicate it to be distinct from the **alpha**, mu, or pi class isozymes. As compared to GSTs of **alpha**, mu, and pi classes, GST zeta displays higher activities toward t-stilbene oxide and Leukotriene A4 methyl ester. GST zeta also **expresses** GSH-peroxidase activity toward hydrogen peroxide. The Kms of GST zeta for CDNB and GSH were comparable to those reported for other **human GSTs** but its Vmax for CDNB, 7620 mol/mol/min, was found to be considerably higher than that reported for other **human GSTs**. The kinetics

of inhibition of GST zeta by hematin, bile acids, and other inhibitors also indicate that it was distinct from the three classes of GST isozymes. These studies suggest that GST zeta corresponds to a locus distinct from GST1, GST2, and GST3 and probably corresponds to the **GST4** locus as suggested previously by Laisney et al. (1984, Human Genet. 68, 221-227). The results of peptide fingerprints and kinetic analysis indicate that as compared to the pi and **alpha** class isozymes, GST zeta has more structural and functional similarities with the mu class isozymes. Besides GST zeta several other GST isozymes belonging to pi and mu class have also been characterized in muscle. The pi class GST isozymes of muscle have considerable charge heterogeneity among them despite identical N-terminal sequences.

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     (FILE 'HOME' ENTERED AT 14:45:53 ON 01 OCT 2002)

     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
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L1             0 S GLYCOSUL (A)TRANSFERASE###
L2          2430 S GLYCOSYL (A)TRANSFERASE###
L3         45237 S GST###
L4         47661 S L2 OR L3
L5         20775 S (HUMAN OR MURINE ) AND L4
L6       5615033 S CLON? OR EXPRESS? OR RECOMBINANT
L7         11204 S L5 AND L6
L8          1697 S (HUMAN OR MURINE ) (A) L4
L9           845 S L8 AND L6
L10            0 S GST4(2W)ALPHA
L11      3576367 S ALPHA
L12          296 S L9 AND L11
L13           49 S "GST4"
L14            0 S "GST4ALPHA"
L15            8 S L13 AND L12
L16            2 DUP REM L15 (6 DUPLICATES REMOVED)

=> dup rem l13
PROCESSING COMPLETED FOR L13
L17           18 DUP REM L13 (31 DUPLICATES REMOVED)

=> d 1-18 ibib ab

L17  ANSWER 1 OF 18  HCAPLUS  COPYRIGHT 2002 ACS
ACCESSION NUMBER:         2002:170765  HCAPLUS
DOCUMENT NUMBER:          137:151612
TITLE:                    Expression and characterization of a novel class of
                          glutathione S-transferase from Anopheles dirus
AUTHOR(S):                Udomsinprasert, R.; Ketterman, A. J.
CORPORATE SOURCE:         Institute of Molecular Biology and Genetics, Mahidol
                          University, Nakhon Pathom, 73170, Thailand
SOURCE:                   Insect Biochemistry and Molecular Biology (2002),
                          32(4), 425-433
                          CODEN: IBMBES; ISSN: 0965-1748
PUBLISHER:                Elsevier Science Ltd.
DOCUMENT TYPE:            Journal
LANGUAGE:                 English
AB    A new Anopheles dirus glutathione S-transferase (GST) has been obtained
      and named adGST4-1.  Both genomic DNA and cDNA for heterologous expression
      were acquired.  The genomic sequence was 3188 bp and consisted of the GST
      gene as well as flanking sequence.  The flanking sequence was analyzed for
      possible regulatory elements that would control gene expression.  In
      Drosophila several of these elements have been shown to be involved in
      development and cell differentiation.  The deduced amino acid sequence has
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low identity compared with the four alternatively spliced enzymes, adGST1-1 to 1-4, from another An. dirus GST gene adgst1AS1. The percent identities are 30-40% and 11-12% comparing adGST4-1 to insect GSTs from Delta and Sigma classes, resp. Enzyme characterization of adGST4-1 shows it to be distinct from the other An. dirus GSTs because of low enzyme activity for customary GST substrates including 1-chloro-2, 4-dinitrobenzene (CDNB). However, this enzyme has a greater affinity of interaction with pyrethroids compared to the other An. dirus GSTs.

REFERENCE COUNT: 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L17 ANSWER 2 OF 18 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 2002:323123 BIOSIS
DOCUMENT NUMBER: PREV200200323123
TITLE: The metabolic fate of 4-hydroxy-trans-2-nonenal (HNE) in cardiac mitochondria.
AUTHOR(S): Liu, Si-Qi (1); Srivastava, Sanjay (1); Prough, Russell; Bhatnagar, Aruni (1)
CORPORATE SOURCE: (1) Medicine, University of Louisville, Louisville, KY USA
SOURCE: FASEB Journal, (March 20, 2002) Vol. 16, No. 4, pp. A144. http://www.fasebj.org/. print.
Meeting Info.: Annual Meeting of the Professional Research Scientists on Experimental Biology New Orleans, Louisiana, USA April 20-24, 2002
ISSN: 0892-6638.
DOCUMENT TYPE: Conference
LANGUAGE: English

AB Several forms of cardiac pathology are associated with oxidative injury to the mitochondria. Nevertheless, the mechanisms by which these organelles protect themselves from oxidants are poorly understood. To examine how electrophiles are detoxified by mitochondria, we studied the metabolism of 4-hydroxy trans-2-nonenal (HNE), a major end-product of lipid peroxidation. The 3 major enzymes involved in HNE metabolism - aldose reductase, glutathione S-transferase (**GST4**-4) and aldehyde dehydrogenase (ALDH-2) were present in the mitochondrial fraction, however, only ALDH-2 was localized to the mitochondrial matrix. The major routes of HNE metabolism in the mitochondria were: conjugation with glutathione and oxidation to the corresponding acid - 4-hydroxynonanoic acid. Notably, the glutathione conjugate formed upon HNE exposure was retained in the mitochondria. These results show that a full complement of functional aldehyde-metabolizing enzymes are localized to the mitochondria, however, the lack of transport mechanisms to extrude potentially toxic glutathione conjugates may be a critical cause of mitochondrial damage due to oxidative stress generated by ischemia-reperfusion or heart failure.

L17 ANSWER 3 OF 18 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 2001:634531 HCAPLUS
DOCUMENT NUMBER: 136:258038
TITLE: Analysis of the chromosome sequence of the legume symbiont Sinorhizobium meliloti strain 1021
AUTHOR(S): Capela, Delphine; Barloy-Hubler, Frederique; Gouzy, Jerome; Bothe, Gordana; Ampe, Frederic; Batut, Jacques; Boistard, Pierre; Becker, Anke; Boutry, Marc; Cadieu, Edouard; Dreano, Stephane; Gloux, Stephanie; Godrie, Therese; Goffeau, Andre; Kahn, Daniel; Kiss, Erno; Lelaure, Valerie; Masuy, David; Pohl, Thomas; Portetelle, Daniel; Puhler, Alfred; Purnelle, Benedicte; Ramsperger, Ulf; Renard, Clotilde; Thebault, Patricia; Vandenbol, Micheline; Weidner, Stefan; Galibert, Francis
CORPORATE SOURCE: Laboratoire de Biologie Moleculaire des Relations Plantes-Microorganismes, Unite Mixte de Recherche (UMR) 215 Centre National de la Recherche Scientifique

(CNRS), Institut National de la Recherche Agronomique, Chemin, Tolosan, F-31326, Fr.
SOURCE: Proceedings of the National Academy of Sciences of the United States of America (2001), 98(17), 9877-9882 CODEN: PNASA6; ISSN: 0027-8424
PUBLISHER: National Academy of Sciences
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Sinorhizobium meliloti is an .alpha.-proteobacterium that forms agronomically important N2-fixing root nodules in legumes. We report here the complete sequence of the largest constituent of its genome, a 62.7% GC-rich 3654,135-bp circular chromosome. Annotation allowed assignment of a function to 59% of the 3341 predicted protein-coding ORFs, the rest exhibiting partial, weak, or no similarity with any known sequence. Unexpectedly, the level of reiteration within this replicon is low, with only two genes duplicated with more than 90% nucleotide sequence identity, transposon elements accounting for 2.2% of the sequence, and a few hundred short repeated palindromic motifs (RIME1, RIME2, and C) widespread over the chromosome. Three regions with a significantly lower GC content are most likely of external origin. Detailed annotation revealed that this replicon contains all housekeeping genes except two essential genes that are located on pSymB. Amino acid/peptide transport and degrdn. and sugar metab. appear as two major features of the S. meliloti chromosome. The presence in this replicon of a large no. of nucleotide cyclases with a peculiar structure, as well as of genes homologous to virulence determinants of animal and plant pathogens, opens perspectives in the study of this bacterium both as a free-living soil microorganism and as a plant symbiont.
REFERENCE COUNT: 53 THERE ARE 53 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L17 ANSWER 4 OF 18 MEDLINE DUPLICATE 1
ACCESSION NUMBER: 2001205848 MEDLINE
DOCUMENT NUMBER: 21096027 PubMed ID: 11181564
TITLE: Chromosomal localization and genomic organization for the galactose/ N-acetylgalactosamine/N-acetylglucosamine 6-O-sulfotransferase gene family.
AUTHOR: Hemmerich S; Lee J K; Bhakta S; Bistrup A; Ruddle N R; Rosen S D
CORPORATE SOURCE: Department of Respiratory Diseases, Roche Bioscience, Palo Alto, CA 94304, USA.
CONTRACT NUMBER: RO1GM5741 (NIGMS)
SOURCE: GLYCOBIOLOGY, (2001 Jan) 11 (1) 75-87.
Journal code: 9104124. ISSN: 0959-6658.
PUB. COUNTRY: England: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-AF176838; GENBANK-AF280086; GENBANK-AF280087; GENBANK-AF280088; GENBANK-AF280089; GENBANK-AI824100
ENTRY MONTH: 200106
ENTRY DATE: Entered STN: 20010611
Last Updated on STN: 20010611
Entered Medline: 20010607
AB The galactose/N-acetylgalactosamine/N-acetylglucosamine 6-O-sulfotransferases (GSTs) are a family of Golgi-resident enzymes that transfer sulfate from 3'phosphoadenosine 5'phospho-sulfate to the 6-hydroxyl group of galactose, N-acetylgalactosamine, or N-acetylglucosamine in nascent glycoproteins. These sulfation modifications are functionally important in settings as diverse as cartilage structure and lymphocyte homing. To date six members of this gene family have been described in human and in mouse. We have determined the chromosomal localization of these genes as well as their genomic organization. While the broadly expressed enzymes implicated in

proteoglycan biosynthesis are located on different chromosomes, the highly tissue specific enzymes GST-3 and 4 are encoded by genes located both in band q23.1--23.2 on chromosome 16. In the mouse, both genes reside in the syntenic region 8E1 on chromosome 8. This cross-species conserved clustering is suggestive of related functional roles for these genes. The human **GST4** locus actually contains two highly similar open reading frames (ORF) that are 50 kb apart and encode two highly similar enzyme isoforms termed GST-4 alpha and GST-4 beta. All genes except GST0 (chondroitin 6-O-sulfotransferase) contain intron-less ORFs. With one exception these are fused directly to sequences encoding the 3' untranslated regions (UTR) of the respective mature mRNAs. The 5' UTRs of these mRNAs are usually encoded by a number of short exons 5' of the respective ORF. 5'UTRs of the same enzyme expressed in different cell types are sometimes derived from different exons located upstream of the ORF. The genomic organization of the GSTs resembles that of certain glycosyltransferase gene families.

L17 ANSWER 5 OF 18 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 2001:334083 BIOSIS
DOCUMENT NUMBER: PREV200100334083
TITLE: Development of a peptide antibody specific to human glutathione S-transferase alpha 4-4 (hGSTA4-4) reveals preferential localization in human liver mitochondria.
AUTHOR(S): Gardner, James L.; Gallagher, Evan P. (1)
CORPORATE SOURCE: (1) Department of Physiological Sciences, University of Florida, Gainesville, FL, 32611: gallaghere@mail.vetmed.ufl.edu USA
SOURCE: Archives of Biochemistry and Biophysics, (June 1, 2001) Vol. 390, No. 1, pp. 19-27. print. ISSN: 0003-9861.
DOCUMENT TYPE: Article
LANGUAGE: English
SUMMARY LANGUAGE: English
AB The reactive cellular products generated during the peroxidation of membrane lipids have been implicated as causative agents in a variety of degenerative diseases and aging. In particular, 4-hydroxynon-2-enal (4HNE) is among the most of the produced during lipid peroxidation. In humans and rodent species, the alpha 4 subclass of glutathione S-transferases (mGSTA4-4, rGSTA4-4, hGST-5.8, and hGSTA4-4) exhibits uniquely high glutathione conjugation activity toward 4HNE and other hydroxyalkenals. In human liver, hGSTA4-4-mediated 4HNE conjugation appears to represent the high-affinity pathway for 4HNE detoxification. In the present study, a highly specific polyclonal antibody was developed against hGSTA4-4. Western blotting analysis of human liver subcellular fractions as well as N-terminal sequencing revealed that hGSTA4-4 was localized to mitochondrial fractions, but was not detected in cytosolic fractions. Our results provide evidence that in adult liver, hGSTA4-4 is specifically targeted to the mitochondrion to the apparent exclusion of the cytosol. Targeting of hGSTA4-4 to the mitochondrion holds implications for degenerative diseases associated with oxidative stress that arise from aerobic respiration.

L17 ANSWER 6 OF 18 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1996:582258 HCAPLUS
DOCUMENT NUMBER: 125:266970
TITLE: Heterogeneity of the glutathione transferase genes encoding enzymes responsible for insecticide degradation in the housefly
AUTHOR(S): Syvanen, Michael; Zhou, Zonghan; Wharton, Jonathan; Goldsbury, Claire; Clark, Alan
CORPORATE SOURCE: School of Medicine, Univ. California, Davis, CA, 95616, USA
SOURCE: Journal of Molecular Evolution (1996), 43(3), 236-240 CODEN: JMEVAU; ISSN: 0022-2844

PUBLISHER: Springer
DOCUMENT TYPE: Journal
LANGUAGE: English
AB One of the four glutathione-S-transferases (GST) that is overproduced in the insecticide-resistant Cornell-R strain of the housefly (Musca domestica) produces an activity that degrades the insecticide di-Me parathion and conjugates glutathione to lindane. In earlier work, it was shown that the resistant Cornell-R carries an amplification, probably a duplication, of one or more of its GST loci and that this amplification is directly related to resistance. Using polymerase chain reaction (PCR) amplification with genomic DNA, multiple copies of the gene encoding the parathion-degrading activity (called MdGst-3) were subcloned from both the ancestral, insecticide-susceptible strain BPM and from the insecticide-resistant Cornell-R. In BPM, three different MdGst-3 genes were identified while in Cornell-R, 12 different MdGst-3 sequences were found that, though closely related to ancestral genes, had diverged by a few nucleotides. This diversity in MdGst-3 genomic sequences in Cornell-R is reflected in the expressed sequences, as sampled through a cDNA bank. Population heterozygosity cannot account for these multiple GST genes. The authors suggest that selection for resistance to insecticides has resulted in not only amplification of the MdGst-3 genes but also in the divergence of sequence between the amplified copies.

L17 ANSWER 7 OF 18 MEDLINE DUPLICATE 2
ACCESSION NUMBER: 95251394 MEDLINE
DOCUMENT NUMBER: 95251394 PubMed ID: 7733673
TITLE: Cloning and expression of a cDNA for mu-class glutathione S-transferase from rabbit liver.
AUTHOR: Lee S H; Lee S H; Han J S; Kim Y S; Koh J K
CORPORATE SOURCE: Department of Biochemistry, College of Medicine, Hanyang University, Seoul, Korea.
SOURCE: ARCHIVES OF BIOCHEMISTRY AND BIOPHYSICS, (1995 Apr 20) 318 (2) 424-9.
Journal code: 0372430. ISSN: 0003-9861.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-L23766
ENTRY MONTH: 199505
ENTRY DATE: Entered STN: 19950608
Last Updated on STN: 19980206
Entered Medline: 19950526

AB A mu-class glutathione S-transferase (GST) cDNA clone, pHMB1, from rabbit liver has been constructed, using a 748-base-pair fragment of GST Yb1 cDNA as a probe. The nucleotide sequence of pHMB1 has been determined, and the complete amino acid sequence has been deduced. Recombinant clone pHMB1 contains a cDNA insert of 1443 base pairs with 654 nucleotides of open reading frame, 33 nucleotides of 5'-untranslated region, and 756 nucleotides of 3'-untranslated region. The open reading frame encodes a polypeptide (rbGST mu I) comprising 218 amino acids with molecular weight of 25,417. Compared to published mu-class GST sequences, rbGST mu I is 73 and 77% identical to rat Yb1 and human **GST4** in amino acid sequence, respectively. The pHMB1 was expressed in Escherichia coli using expression vector pIH821 and the expressed GST was purified as a single band on polyacrylamide gel electrophoresis by maltose- and glutathione-affinity column chromatography. Rabbit liver GST protein expressed by this system was catalytically active. The functional characterization was done on the expressed protein. The rabbit liver GST expressed in E. coli showed greater activity toward 1,2-dichloro-4-nitrobenzene than mu-class isozymes in rabbit hepatic tissue (T. Primiano and R.F. Novak (1993) Arch. Biochem. Biophys. 301, 404-410). Enzymatic activity of expressed protein toward the substrate 1-chloro-2,4-dinitrobenzene was inhibited by triethyltin bromide, Cibacron blue,

triphenyltin chloride, bromosulfophthalein, and hematin. RNA blot hybridization demonstrated that the pHMB1 mRNA was well expressed in rabbit liver, brain, and kidney.

L17 ANSWER 8 OF 18 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1993:342864 BIOSIS
DOCUMENT NUMBER: PREV199396039864
TITLE: Chromosomal assignments of genes for rat glutathione S-transferase Yb1 (GSTA3) and Yb2 (GSTA4) subunits.
AUTHOR(S): Muramatsu, Y.; Yamada, T.; Agui, T.; Yamada, J.; Serikawa, T.; Matsumoto, Kozo (1)
CORPORATE SOURCE: (1) Inst. Animal Exp., Univ. Tokushima Sch. Med., Kuramoto 3, Tokushima 770 Japan
SOURCE: Cytogenetics and Cell Genetics, (1993) Vol. 63, No. 3, pp. 141-143.
ISSN: 0301-0171.
DOCUMENT TYPE: Article
LANGUAGE: English
AB Chromosomal assignments of genes for rat glutathione S-transferase Yb1 (GSTA3) and Yb2 (**GST4**) subunits were performed by Southern blot analyses of somatic cell hybrid DNAs. Both GSTA3 and GSTA4 were assigned to rat chromosome 2.

L17 ANSWER 9 OF 18 MEDLINE DUPLICATE 3
ACCESSION NUMBER: 91239584 MEDLINE
DOCUMENT NUMBER: 91239584 PubMed ID: 2034681
TITLE: Cloning, expression, and characterization of a class-mu glutathione transferase from human muscle, the product of the **GST4** locus.
AUTHOR: Vorachek W R; Pearson W R; Rule G S
CORPORATE SOURCE: Department of Biochemistry, University of Virginia, Charlottesville 22908.
CONTRACT NUMBER: RR-05431 (NCRR)
SOURCE: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, (1991 May 15) 88 (10) 4443-7.
Journal code: 7505876. ISSN: 0027-8424.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-M57642; GENBANK-M57643; GENBANK-M57644; GENBANK-M61861; GENBANK-M61862; GENBANK-M61863; GENBANK-M61864; GENBANK-M63509; GENBANK-M68851; GENBANK-M68852
ENTRY MONTH: 199106
ENTRY DATE: Entered STN: 19910714
Last Updated on STN: 19980206
Entered Medline: 19910625
AB A class-mu glutathione transferase cDNA clone, GTHMUS, was isolated from human myoblasts and its sequence was determined. The sequence predicts a protein of molecular weight 25,599 whose 24 amino-terminal residues are identical to those of the class-mu isoenzyme expressed from the **GST4** locus. The GTHMUS cDNA shares 93.7% nucleotide sequence identity with a human liver cDNA clone, GTH411, that is encoded at the GST1 locus. Comparison of the liver and muscle cDNA sequences shows two regions of remarkable sequence conservation: a 140-nucleotide region in the 5' coding portion of the molecule that has a single silent nucleotide substitution, and a 550-nucleotide region, including the entire 3' noncoding region, that has only three nucleotide substitutions or deletions. This sequence conservation suggests that gene conversion has occurred between the human GST1 and **GST4** glutathione transferase gene loci. The human muscle and liver glutathione transferase clones GTHMUS and GTH411 have been expressed in Escherichia coli. The kinetic mechanism of the muscle enzyme was examined in product inhibition studies.

The inhibition patterns are best modeled by a steady-state ordered bi-bi reaction mechanism. Glutathione is the first substrate bound and chloride ion is the first product released. Chloride ion inhibits the muscle enzyme.

L17 ANSWER 10 OF 18 MEDLINE DUPLICATE 4
ACCESSION NUMBER: 91174747 MEDLINE
DOCUMENT NUMBER: 91174747 PubMed ID: 2006908
TITLE: Purification and characterization of acidic glutathione S-transferase 6 from human brain.
AUTHOR: Suzuki T; Shaw D C; Board P G
CORPORATE SOURCE: Human Genetics Group, John Curtin School of Medical Research, Australian National University, Canberra.
SOURCE: BIOCHEMICAL JOURNAL, (1991 Mar 1) 274 (Pt 2) 405-8.
Journal code: 2984726R. ISSN: 0264-6021.
PUB. COUNTRY: ENGLAND: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199104
ENTRY DATE: Entered STN: 19910512
Last Updated on STN: 19980206
Entered Medline: 19910422

AB An acidic glutathione S-transferase (GST) isoenzyme termed GST6 has been isolated from human brain, characterized and compared with other isoenzymes. The N-terminal amino acid sequence of GST6 was found to be identical with that of **GST4** previously purified from human muscle. GST6 cross-reacted with antibody raised against **GST4**, but not with antisera raised against GST1, GST2 or GST3. The subunit Mr and pI of GST6 were found to be different from those of **GST4**. The present results indicate that GST6 is another member of the Mu evolutionary class which in man also includes GST1, **GST4** and GST5. A minor component that co-purified with GST6 was shown to have an N-terminal sequence similar to, but not identical with, that of GST3. This isoenzyme may be an additional member of the Pi evolutionary class.

L17 ANSWER 11 OF 18 MEDLINE DUPLICATE 5
ACCESSION NUMBER: 91119426 MEDLINE
DOCUMENT NUMBER: 91119426 PubMed ID: 1846734
TITLE: Purification and characterization of human muscle glutathione S-transferases: evidence that glutathione S-transferase zeta corresponds to a locus distinct from GST1, GST2, and GST3.
AUTHOR: Singhal S S; Ahmad H; Sharma R; Gupta S; Haque A K; Awasthi Y C
CORPORATE SOURCE: Department of Human Biological Chemistry & Genetics, University of Texas Medical Branch, Galveston 77550.
CONTRACT NUMBER: CA-27967 (NCI)
EY-04396 (NEI)
GM-32304 (NIGMS)
SOURCE: ARCHIVES OF BIOCHEMISTRY AND BIOPHYSICS, (1991 Feb 15) 285 (1) 64-73.
Journal code: 0372430. ISSN: 0003-9861.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199103
ENTRY DATE: Entered STN: 19910329
Last Updated on STN: 19980206
Entered Medline: 19910306

AB Human muscle glutathione S-transferase isozyme, GST zeta (pI 5.2) has been purified by three different methods using immunoaffinity chromatography, DEAE cellulose chromatography, and isoelectric focusing. GST zeta prepared

by any of the three methods does not recognize antibodies raised against the alpha, mu, or pi class glutathione S-transferases of human tissues. GST zeta has a blocked N-terminus and its peptide fingerprints also indicate it to be distinct from the alpha, mu, or pi class isozymes. As compared to GSTs of alpha, mu, and pi classes, GST zeta displays higher activities toward t-stilbene oxide and Leukotriene A4 methyl ester. GST zeta also expresses GSH-peroxidase activity toward hydrogen peroxide. The Kms of GST zeta for CDNB and GSH were comparable to those reported for other human GSTs but its Vmax for CDNB, 7620 mol/mol/min, was found to be considerably higher than that reported for other human GSTs. The kinetics of inhibition of GST zeta by hematin, bile acids, and other inhibitors also indicate that it was distinct from the three classes of GST isozymes. These studies suggest that GST zeta corresponds to a locus distinct from GST1, GST2, and GST3 and probably corresponds to the **GST4** locus as suggested previously by Laisney et al. (1984, Human Genet. 68, 221-227). The results of peptide fingerprints and kinetic analysis indicate that as compared to the pi and alpha class isozymes, GST zeta has more structural and functional similarities with the mu class isozymes. Besides GST zeta several other GST isozymes belonging to pi and mu class have also been characterized in muscle. The pi class GST isozymes of muscle have considerable charge heterogeneity among them despite identical N-terminal sequences.

L17 ANSWER 12 OF 18 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1991:178519 HCAPLUS
DOCUMENT NUMBER: 114:178519
TITLE: Binding of steroid hormones to class .mu. subunits of glutathione S-transferases in the rat liver
AUTHOR(S): Homma, Hisato; Saitoh, Tadanori; Hirata, Yasuji; Ishigaki, Seishi; Watanabe, Naoki; Kohgo, Yutaka; Nitsu, Yoshiro
CORPORATE SOURCE: 4th Dep. Intern. Med., Sapporo Med. Coll., Sapporo, Japan
SOURCE: Kanzo (1990), 31(11), 1282-9
CODEN: KNZOAU; ISSN: 0451-4203
DOCUMENT TYPE: Journal
LANGUAGE: Japanese
AB The binding of steroid hormones to glutathione S-transferase (GST) isoenzymes was analyzed by CD spectroscopy and affinity labeling with dexamethasone 21-methanesulfonate to det. which GST isoenzymes can actually function as a high-affinity steroid-binding protein in rat liver. Dexamethasone 21-mesylate affinity labeling of cytosolic exts. from primary culture of hepatocyte indicated preferential labeling of class .mu. subunits of GSTs. In mixts. of multiple rat liver GSTs, corticosterone also preferentially interacted with GST class .mu., esp. **GST4**-4, rather than other GST isoenzymes. Glucocorticoids such as corticosterone and dexamethasone had higher affinities than did estradiol and testosterone for binding to **GST4**-4. In view of the selective high-affinity binding of steroid hormones to **GST4**-4, this protein has the potential to function in transport, metab., and perhaps even in the action of steroid hormones.

L17 ANSWER 13 OF 18 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1990:195869 BIOSIS
DOCUMENT NUMBER: BA89:102540
TITLE: IDENTIFICATION OF A GLUTATHIONE S-TRANSFERASE ISOZYME AS A HIGH AFFINITY STEROID BINDING PROTEIN IN THE LIVER.
AUTHOR(S): HOMMA H
CORPORATE SOURCE: DEP. INTERN. MED. SECTION 4 , SAPPORO MED. COLL., JAPAN.
SOURCE: SAPPORO MED J, (1989) 58 (6), 391-402.
CODEN: SIZSAR. ISSN: 0036-472X.
FILE SEGMENT: BA; OLD
LANGUAGE: Japanese
AB The glutathione S transferases (GSTs) are known to bind bilirubin, heme,

bile acids, fatty acids, and other metabolites, and recently, evidence has been presented for binding of steroid hormones to GST 1-1 (Ligandin) (Litwack, G. et al.: Nature 234, 466, 1971) and to an anionic GST (Maruyana and Listowsky,: J. Biol. Chem. 259, 12447-12455, 1984). To determine which GST isozymes can function as a high affinity steroid binding protein in the rat liver, GSTs were purified by chromatofocusing columns combined with Lysyl GSH affinity chromatography. Binding of steroid hormones to GST isozymes was analysed by circular dichroism spectroscopy and affinity labeling with dexamethasone 21-methanesulfonate. Dexamethasone mesylate affinity labeling of cytosolic extracts indicated preferential labeling of class.mu. subunits of GSTs. In mixtures of the multiple rat liver GSTs, corticosterone also preferentially interacted with GST class.mu., especially **GST4**-4, rather than other GST isozymes. Glucocorticoids such as corticosterone and dexamethasone had higher affinities than aldosterone and testosterone for binding to **GST4**-4. These results suggest that the binding of steroid hormones to GST class.mu. may be correlated with structural features and stereochemistry of the ligands. In view of the selective high affinity binding of steroid hormones to **GST4**-4, this protein has the potential to function in transport, metabolism and perhaps even in the action of steroid hormones.

L17 ANSWER 14 OF 18 MEDLINE DUPLICATE 6
ACCESSION NUMBER: 88000729 MEDLINE
DOCUMENT NUMBER: 88000729 PubMed ID: 3115298
TITLE: Studies on the developmental expression of glutathione S-transferase isoenzymes in human heart and diaphragm.
AUTHOR: Hirrell P A; Hume R; Fryer A A; Collins M F; Drew R; Bradwell A R; Strange R C
CORPORATE SOURCE: Department of Postgraduate Medicine, University of Keele, Staffordshire, U.K.
SOURCE: BIOCHIMICA ET BIOPHYSICA ACTA, (1987 Oct 15) 915 (3) 371-7. Journal code: 0217513. ISSN: 0006-3002.
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 198711
ENTRY DATE: Entered STN: 19900305
Last Updated on STN: 20020212
Entered Medline: 19871113

AB The developmental expression of the basic, near-neutral and acidic isoenzymes of glutathione S-transferase (RX:glutathione R-transferase, EC 2.5.1.18) has been studied in heart and diaphragm. Neither these enzymes nor the putative muscle-specific **GST4** isoenzyme demonstrated any developmental trends in expression. In vitro hybridisation and SDS-discontinuous polyacrylamide gel electrophoresis were used to show that the **GST4** isoenzyme is a homodimer composed of monomers that have a slightly larger molecular weight than the near-neutral isoenzyme. The sensitivity of **GST4** to inhibitors also appeared similar to that of the GST1 2 isoenzyme. Immunodiffusion and immunoblotting techniques were used to show that the acidic enzyme in muscle is immunologically identical to that in other tissues.

L17 ANSWER 15 OF 18 EMBASE COPYRIGHT 2002 ELSEVIER SCI. B.V.
ACCESSION NUMBER: 87220758 EMBASE
DOCUMENT NUMBER: 1987220758
TITLE: Studies on the developmental expression of glutathione S-transferase isoenzymes in humen heart and diaphragm.
AUTHOR: Hirell P.A.; Hume R.; Fryer A.A.; Collins M.F.; Drew R.; Bradwell A.R.; Strange R.C.
CORPORATE SOURCE: Clinical Biochemical Research Laboratory, Department of Postgraduate Medicine, University of Keele, North Staffordshire Hospital Centre, Staffordshire, ST4 7PA,

United Kingdom
SOURCE: Biochimica et Biophysica Acta - Protein Structure and Molecular Enzymology, (1987) 915/3 (371-377).
ISSN: 0167-4838 CODEN: BBAEDZ
COUNTRY: Netherlands
DOCUMENT TYPE: Journal
FILE SEGMENT: 021 Developmental Biology and Teratology
029 Clinical Biochemistry
LANGUAGE: English

AB The developmental expression of the basic, near-neutral and acidic isoenzymes of glutathione S-transferase (RS: glutathione R-transferase, EC 2.5.2.28) has been studied in heart and diaphragm. Neither these enzymes nor the putative muscle-specific **GST4** isonzyme demonstrated any developmental trends in expression. In vitro hybridisation and SDS-discontinuous polyacrylamide gel electrophoresis were used to show that the **GST4** isoenzyme is a homodimer composed of monomers that have a slightly larger molecular weight than the near-neutral isoenzyme. The sensitivity of **GST4** inhibitors also appeared similar to that of the GST1 2 isoenzyme. Immunodiffusion and immunoblotting techniques were used to show that the acidic enzyme in muscle is immunologically identical to that in other tissues.

L17 ANSWER 16 OF 18 MEDLINE DUPLICATE 7
ACCESSION NUMBER: 87192710 MEDLINE
DOCUMENT NUMBER: 87192710 PubMed ID: 3570286
TITLE: Liver glutathione S-transferase polymorphism in Japanese and its pharmacogenetic importance.
AUTHOR: Harada S; Abei M; Tanaka N; Agarwal D P; Goedde H W
SOURCE: HUMAN GENETICS, (1987 Apr) 75 (4) 322-5.
Journal code: 7613873. ISSN: 0340-6717.
PUB. COUNTRY: GERMANY, WEST: Germany, Federal Republic of
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 198706
ENTRY DATE: Entered STN: 19900303
Last Updated on STN: 19980206
Entered Medline: 19870605

AB A total of 168 autopsy liver extracts from Japanese individuals were examined for the glutathione S-transferase (GST) isozymes by means of starch gel electrophoresis. The gene frequencies of GST1*1, GST1*2, and GST1*0 in Japanese were 0.252, 0.057, and 0.691, respectively. GST1*3 was detected as a rare variant allele. The incidence of GST1 0 in 41 liver biopsy samples from patients suffering from various liver diseases was investigated using polyacrylamide gel isoelectric focusing. The GST1 0 phenotype was found more frequently in livers with hepatitis and carcinoma than in control livers. The isozymes coded by different GST loci were partially purified and characterized to study their biochemical properties. The apparent Km values with 1-chloro-2,4-dinitrobenzene (CDNB) as substrate for the isozymes at the GST1, GST2, GST3, and **GST4** loci were 604, 1345, 776, and 591 microM, respectively.

L17 ANSWER 17 OF 18 MEDLINE DUPLICATE 8
ACCESSION NUMBER: 86103141 MEDLINE
DOCUMENT NUMBER: 86103141 PubMed ID: 4084207
TITLE: The human glutathione S-transferases: developmental aspects of the GST1, GST2, and GST3 loci.
AUTHOR: Strange R C; Davis B A; Faulder C G; Cotton W; Bain A D; Hopkinson D A; Hume R
SOURCE: BIOCHEMICAL GENETICS, (1985 Dec) 23 (11-12) 1011-28.
Journal code: 0126611. ISSN: 0006-2928.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English

FILE SEGMENT: Priority Journals
ENTRY MONTH: 198602
ENTRY DATE: Entered STN: 19900321
Last Updated on STN: 19980206
Entered Medline: 19860220

AB The expression of the GST1, GST2, and GST3 loci in fetal, neonatal, and infant tissues has been studied using starch gel electrophoresis and chromatofocusing. Each locus demonstrated developmental changes in expression, some of which were specific to a single tissue while others occurred in several tissues. GST1 was not usually expressed in any of the tissues studied before 30 weeks of gestation but steadily increased thereafter until adult levels were reached in late infancy. In neonates and older infants the frequencies of the GST1*0, GST1*1, and GST1*2 alleles were 0.79, 0.07, and 0.14, respectively. GST2 was always expressed in liver and adrenal but was only weakly expressed in spleen, cardiac muscle, and diaphragm. In kidney this locus was not usually expressed until nearly 1 year after birth. The GST3 isoenzymes were present in all fetal, neonatal, and infant tissues, although their expression in liver decreased after 30 weeks of gestation. Other isoenzymes with fast anodal mobilities were also identified in several tissues; these are believed to be GST3 isoenzymes that have undergone posttranslational modification rather than products of the putative **GST4** locus. No specifically fetal isoenzymes were detected.

L17 ANSWER 18 OF 18 MEDLINE DUPLICATE 9
ACCESSION NUMBER: 85053145 MEDLINE
DOCUMENT NUMBER: 85053145 PubMed ID: 6500576
TITLE: Human genes for glutathione S-transferases.
AUTHOR: Laisney V; Nguyen Van Cong; Gross M S; Frezal J
SOURCE: HUMAN GENETICS, (1984) 68 (3) 221-7.
Journal code: 7613873. ISSN: 0340-6717.
PUB. COUNTRY: GERMANY, WEST: Germany, Federal Republic of
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 198501
ENTRY DATE: Entered STN: 19900320
Last Updated on STN: 19980206
Entered Medline: 19850122

AB The tissue distribution of different glutathione S-transferases (GST) is analysed by electrophoresis. The existence of GST"e" (erythrocyte), GST3, GST1, and GST2 is confirmed. GST"e" the fastest and most thermolabile of different GST analysed is observed only in erythrocyte cells. GST3 which migrates more slowly than GST"e" is present in all tissues and cells analysed, excepted for erythrocyte cells in which only GST"e" is observed. GST1 presents a polymorphism with four phenotypes, 1, 1/2, 2, and 0 controlled by three alleles 1, 2, and 0 (null). With the sample of 56 livers analysed the different frequencies obtained are 9%, 5%, 43%, 43% for the phenotypes 1, 1/2, 2, and 0 respectively and 0.074 (p), 0.279 (q), 0.647 (r) for the alleles, 1, 2, and 0 (null). GST2 presents variant patterns due probably, in the majority of cases, to post-synthetic modifications rather than allelic variation. Two new GST are described, **GST4** and GST5. **GST4** abundant in muscle tissue is a dimeric protein. **GST4** forms with GST1 a heterodimeric band. GST5 is observed in brain homogenates. For the chromosome localization the results obtained by man (leucocytes)-mouse somatic cell hybrid analysis indicate that the gene for leucocytes GST is on chromosome 11. This gene is the structural GST3 gene.

=> e rosen s/au
E1 1 ROSEN ROSLYN G/AU
E2 2 ROSEN RUDOLPH A/AU
E3 2288 --> ROSEN S/AU

```
E4            17      ROSEN S A/AU
E5             8      ROSEN S B/AU
E6           141      ROSEN S C/AU
E7           711      ROSEN S D/AU
E8             8      ROSEN S D */AU
E9             1      ROSEN S D C/AU
E10           53      ROSEN S E/AU
E11           12      ROSEN S F/AU
E12          145      ROSEN S G/AU

=> s e3
L18         2288 "ROSEN S"/AU

=> d his

     (FILE 'HOME' ENTERED AT 14:45:53 ON 01 OCT 2002)

     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
     LIFESCI' ENTERED AT 14:46:13 ON 01 OCT 2002
L1             0 S GLYCOSUL (A)TRANSFERASE###
L2          2430 S GLYCOSYL (A)TRANSFERASE###
L3         45237 S GST###
L4         47661 S L2 OR L3
L5         20775 S (HUMAN OR MURINE ) AND L4
L6       5615033 S CLON? OR EXPRESS? OR RECOMBINANT
L7         11204 S L5 AND L6
L8          1697 S (HUMAN OR MURINE ) (A) L4
L9           845 S L8 AND L6
L10            0 S GST4(2W)ALPHA
L11      3576367 S ALPHA
L12          296 S L9 AND L11
L13           49 S "GST4"
L14            0 S "GST4ALPHA"
L15            8 S L13 AND L12
L16            2 DUP REM L15 (6 DUPLICATES REMOVED)
L17           18 DUP REM L13 (31 DUPLICATES REMOVED)
                 E ROSEN S/AU
L18         2288 S E3

=> s l5 and l18
L19            0 L5 AND L18

=> e lee J K L/au
E1             5      LEE J K J/AU
E2             1      LEE J K JERRY/AU
E3             1 --> LEE J K L/AU
E4             3      LEE J K M/AU
E5             3      LEE J K N/AU
E6           179      LEE J K P/AU
E7             1      LEE J K S/AU
E8           451      LEE J K T/AU
E9            18      LEE J K W/AU
E10            7      LEE J K Y/AU
E11            2      LEE J KELLY/AU
E12          527      LEE J L/AU

=> e lee J K /au
E1           133      LEE J JACK/AU
E2             1      LEE J JR/AU
E3          3333 --> LEE J K/AU
E4             4      LEE J K F/AU
E5             4      LEE J K H/AU
E6             5      LEE J K J/AU
E7             1      LEE J K JERRY/AU
```

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E8            1     LEE J K L/AU
E9            3     LEE J K M/AU
E10           3     LEE J K N/AU
E11         179     LEE J K P/AU
E12           1     LEE J K S/AU

=> s e3
L20       3333 "LEE J K"/AU

=> s l5 and l20
L21         17 L5 AND L20

=> dup rem l21
PROCESSING COMPLETED FOR L21
L22            6 DUP REM L21 (11 DUPLICATES REMOVED)

=> d 1-6 ibib ab

L22   ANSWER 1 OF 6  BIOTECHDS COPYRIGHT 2002 THOMSON DERWENT AND ISI
ACCESSION NUMBER: 2001-06117  BIOTECHDS
TITLE:            New glycosyl-sulfotransferases (GST)-4-alpha,
                  GST-4-beta and GST-6 for diagnostic and
                  therapeutic agent screening applications;
                     vector-mediated gene transfer, expression in host cell,
                     monoclonal antibody and transgenic animal for selectin
                     binding-inhibitor, drug screening and disease therapy,
                     diagnosis and gene therapy
AUTHOR:           Rosen S D; Lee J K; Hemmerich S
PATENT ASSIGNEE:  Univ.California
LOCATION:         Oakland, CA, USA.
PATENT INFO:      WO 2001006015 25 Jan 2001
APPLICATION INFO: WO 2000-US19741 19 Jul 2000
PRIORITY INFO:    US 2000-593828 13 Jul 2000; US 1999-144694 20 Jul 1999
DOCUMENT TYPE:    Patent
LANGUAGE:         English
OTHER SOURCE:     WPI: 2001-138471 [14]
AB    A glycosyl-sulfotransferase (GST) (I) selected from the group
      GST-4-alpha, GST-4-beta and GST-6, is
      claimed.  Also claimed are: a fragment of (I); a DNA (II) encoding (I); a
      DNA or its mimetic that hybridizes to (II) or its complementary sequence;
      an expression cassette (III) containing a transcriptional initiation
      region functional in an expression host and (II) under the
      transcriptional regulation of the transcriptional initiation region and a
      transcriptional termination region; a host cell (IV) containing (III);
      the cellular progeny of (IV); a method of producing (I); a monoclonal
      antibody that specifically binds to (I); and a non-human
      transgenic animal model for gene function, where the animal contains an
      introduced alteration in a gene encoding (I).  (I) is useful for
      inhibiting a binding event between a selectin and a selectin ligand,
      which involves contacting the selectin with a non-sulfated selectin
      ligand.  (II) encoding (I) is also useful in gene therapy to treat
      disorders such as acute or chronic inflammation and transplant tissue
      rejection and also for disease diagnosis.  (44pp)

L22  ANSWER 2 OF 6     MEDLINE                              DUPLICATE 1
ACCESSION NUMBER:   2001205848     MEDLINE
DOCUMENT NUMBER:    21096027   PubMed ID: 11181564
TITLE:              Chromosomal localization and genomic organization for the
                    galactose/ N-acetylgalactosamine/N-acetylglucosamine
                    6-O-sulfotransferase gene family.
AUTHOR:             Hemmerich S; Lee J K; Bhakta S; Bistrup A; Ruddle
                    N R; Rosen S D
CORPORATE SOURCE:   Department of Respiratory Diseases, Roche Bioscience, Palo
                    Alto, CA 94304, USA.
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CONTRACT NUMBER: RO1GM5741 (NIGMS)
SOURCE: GLYCOBIOLOGY, (2001 Jan) 11 (1) 75-87.
Journal code: 9104124. ISSN: 0959-6658.
PUB. COUNTRY: England: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-AF176838; GENBANK-AF280086; GENBANK-AF280087; GENBANK-AF280088; GENBANK-AF280089; GENBANK-AI824100
ENTRY MONTH: 200106
ENTRY DATE: Entered STN: 20010611
Last Updated on STN: 20010611
Entered Medline: 20010607

AB The galactose/N-acetylgalactosamine/N-acetylglucosamine 6-O-sulfotransferases (**GSTs**) are a family of Golgi-resident enzymes that transfer sulfate from 3'phosphoadenosine 5'phospho-sulfate to the 6-hydroxyl group of galactose, N-acetylgalactosamine, or N-acetylglucosamine in nascent glycoproteins. These sulfation modifications are functionally important in settings as diverse as cartilage structure and lymphocyte homing. To date six members of this gene family have been described in **human** and in mouse. We have determined the chromosomal localization of these genes as well as their genomic organization. While the broadly expressed enzymes implicated in proteoglycan biosynthesis are located on different chromosomes, the highly tissue specific enzymes **GST**-3 and 4 are encoded by genes located both in band q23.1--23.2 on chromosome 16. In the mouse, both genes reside in the syntenic region 8E1 on chromosome 8. This cross-species conserved clustering is suggestive of related functional roles for these genes. The **human GST4** locus actually contains two highly similar open reading frames (ORF) that are 50 kb apart and encode two highly similar enzyme isoforms termed **GST**-4 alpha and **GST**-4 beta. All genes except **GST0** (chondroitin 6-O-sulfotransferase) contain intron-less ORFs. With one exception these are fused directly to sequences encoding the 3' untranslated regions (UTR) of the respective mature mRNAs. The 5' UTRs of these mRNAs are usually encoded by a number of short exons 5' of the respective ORF. 5'UTRs of the same enzyme expressed in different cell types are sometimes derived from different exons located upstream of the ORF. The genomic organization of the **GSTs** resembles that of certain glycosyltransferase gene families.

L22 ANSWER 3 OF 6 MEDLINE DUPLICATE 2
ACCESSION NUMBER: 2001098512 MEDLINE
DOCUMENT NUMBER: 20568280 PubMed ID: 10956661
TITLE: Sulfation of N-acetylglucosamine by chondroitin 6-sulfotransferase 2 (**GST**-5).
AUTHOR: Bhakta S; Bartes A; Bowman K G; Kao W M; Polsky I; **Lee J K**; Cook B N; Bruehl R E; Rosen S D; Bertozzi C R; Hemmerich S
CORPORATE SOURCE: Department of Respiratory Diseases, Roche Bioscience, Palo Alto, California 94304, USA.
CONTRACT NUMBER: R37GM23547 (NIGMS)
RO1GM5741 (NIGMS)
RO1GM59907-01 (NIGMS)
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (2000 Dec 22) 275 (51) 40226-34.
Journal code: 2985121R. ISSN: 0021-9258.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-AF280089
ENTRY MONTH: 200102
ENTRY DATE: Entered STN: 20010322
Last Updated on STN: 20010322

Entered Medline: 20010201

AB Based on sequence homology with a previously cloned **human** GlcNAc 6-O-sulfotransferase, we have identified an open reading frame (ORF) encoding a novel member of the Gal/GalNAc/GlcNAc 6-O-sulfotransferase (**GST**) family termed **GST**-5 on the **human** X chromosome (band Xp11). **GST**-5 has recently been characterized as a novel GalNAc 6-O-sulfotransferase termed chondroitin 6-sulfotransferase-2 (Kitagawa, H., Fujita, M., Itio, N., and Sugahara K. (2000) J. Biol. Chem. 275, 21075-21080). We have coexpressed a **human GST**-5 cDNA with a GlyCAM-1/IgG fusion protein in COS-7 cells and observed four-fold enhanced [(35)S]sulfate incorporation into this mucin acceptor. All mucin-associated [(35)S]sulfate was incorporated as GlcNAc-6-sulfate or Galbeta1-->4GlcNAc-6-sulfate. **GST**-5 was also expressed in soluble epitope-tagged form and found to catalyze 6-O-sulfation of GlcNAc residues in synthetic acceptor structures. In particular, **GST**-5 was found to catalyze 6-O-sulfation of beta-benzyl GlcNAc but not alpha- or beta-benzyl GalNAc. In the mouse genome we have found a homologous ORF that predicts a novel **murine** GlcNAc 6-O-sulfotransferase with 88% identity to the **human** enzyme. This gene was mapped to mouse chromosome X at band XA3.1-3.2. **GST**-5 is the newest member of an emerging family of carbohydrate 6-O-sulfotransferases that includes chondroitin 6-sulfotransferase (**GST**-0), keratan-sulfate galactose 6-O-sulfotransferase (**GST**-1), the ubiquitously expressed GlcNAc 6-O-sulfotransferase (**GST**-2), high endothelial cell GlcNAc 6-O-sulfotransferase (**GST**-3), and intestinal GlcNAc 6-O-sulfotransferase (**GST**-4).

L22 ANSWER 4 OF 6 MEDLINE DUPLICATE 3
ACCESSION NUMBER: 2000487950 MEDLINE
DOCUMENT NUMBER: 20491927 PubMed ID: 11035075
TITLE: Distinct **human** T cell repertoires mediate immediate and delayed-type hypersensitivity to the Trichophyton antigen, Tri r 2.
AUTHOR: Woodfolk J A; Sung S S; Benjamin D C; **Lee J K**; Platts-Mills T A
CORPORATE SOURCE: Asthma and Allergic Diseases Center, Department of Internal Medicine, University of Virginia, Charlottesville, VA 22908, USA.. jaw4m@virginia.edu
CONTRACT NUMBER: AI30840 (NIAID)
NIEHS/NIAID-34607 (NCEH)
SOURCE: JOURNAL OF IMMUNOLOGY, (2000 Oct 15) 165 (8) 4379-87.
Journal code: 2985117R. ISSN: 0022-1767.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Abridged Index Medicus Journals; Priority Journals
ENTRY MONTH: 200011
ENTRY DATE: Entered STN: 20010322
Last Updated on STN: 20010322
Entered Medline: 20001114

AB The 29-kDa subtilase homologue, Tri r 2, derived from the dermatophyte fungus Trichophyton rubrum, exhibits unique immunologic characteristics in its ability to elicit immediate (IH) and delayed-type (DTH) hypersensitivity skin tests in different individuals. Thus, Tri r 2 provides a model for comparing the T cell repertoire in subjects with distinct immune responses to a single Ag. Recombinant Tri r 2 produced as a **GST** fusion protein in Escherichia coli stimulated strong in vitro lymphoproliferative responses in 10 IH and 10 DTH responders. Patterns of T cell epitope recognition were compared between skin test groups using 28 overlapping peptides (each in 12 replicate wells) derived from Tri r 2 to stimulate T lymphocyte proliferation in vitro. Peptide 5 (P5; aa 41-60) induced the strongest response in DTH subjects and showed the largest difference between DTH and IH responders in proliferation

(mean standardized index, 2.22 and 0.82, respectively; p = 0.0047) and number of positive wells (81 vs 12). Responses to P5 were associated with diverse HLA haplotypes. These results showed that P5 contains an immunodominant epitope specifically associated with DTH and that this peptide is recognized in a permissive manner. Cross-validated linear discriminant analysis using T cell proliferative responses to two regions of Tri r 2 (aa 51-90 and 231-270) gave a 95% predictive accuracy for classification of subjects into IH or DTH groups. We conclude that different immune responses to Trichophyton are mediated by distinct T cell repertoires between individuals with IH and DTH reactions to Tri r 2.

L22 ANSWER 5 OF 6 MEDLINE DUPLICATE 4
ACCESSION NUMBER: 2001323755 MEDLINE
DOCUMENT NUMBER: 20547137 PubMed ID: 11097350
TITLE: Influence of glutathione S-transferase M1 and T1 genotypes on larynx cancer risk among Korean smokers.
AUTHOR: Hong Y J; **Lee J K**; Lee G H; Hong S I
CORPORATE SOURCE: Department of Clinical Pathology, Korea Cancer Center Hospital, Seoul.. clinchem@kcchsun.kcch.re.kr
SOURCE: CLINICAL CHEMISTRY AND LABORATORY MEDICINE, (2000 Sep) 38 (9) 917-9.
Journal code: 9806306. ISSN: 1434-6621.
PUB. COUNTRY: GERMANY: Germany, Federal Republic of
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200106
ENTRY DATE: Entered STN: 20010611
Last Updated on STN: 20010611
Entered Medline: 20010607

AB Glutathione S-transferase (**GST**) isoenzymes are involved in the detoxification of major carcinogens present in tobacco smoke. It is thus conceivable that deficiency in **GST** activity due to homozygous deletions of the **GSTM1** and **GSTT1** genes (the null genotypes) may modulate susceptibility to smoking-induced cancers. The influence of the **GSTM1** and **GSTT1** null genotypes on larynx cancer risk among the Korean population were evaluated using peripheral blood DNA from 82 larynx cancer patients and 63 healthy controls, all of whom were male current smokers. Increased larynx cancer risk was related to the **GSTM1** null genotype (odds ratio (OR)=3.53, 95% confidence interval (CI)=1.27-9.83). The OR associated with the **GSTT1** null genotype was also increased, but did not reach statistical significance (OR=1.83, 95% CI=0.70-4.79). Individuals lacking both the **GSTM1** and **GSTT1** genes were at a significantly higher risk for larynx cancer than individuals with both genes present (OR=4.04, 95% CI=1.33-12.30). These data confirm that the **GSTM1** null genotype is an important risk modifier for larynx cancer among Korean smokers and combined **GSTM1** and **GSTT1** null genotypes could be a useful predictor of genetic susceptibility to larynx cancer.

L22 ANSWER 6 OF 6 MEDLINE DUPLICATE 5
ACCESSION NUMBER: 1999423499 MEDLINE
DOCUMENT NUMBER: 99423499 PubMed ID: 10491328
TITLE: Cloning and characterization of a mammalian N-acetylglucosamine-6-sulfotransferase that is highly restricted to intestinal tissue.
AUTHOR: **Lee J K**; Bhakta S; Rosen S D; Hemmerich S
CORPORATE SOURCE: Department of Anatomy and Program in Immunology, University of California, San Francisco, California, 94143, USA.
CONTRACT NUMBER: R37GM23547 (NIGMS)
R01GM5741 (NIGMS)
SOURCE: BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, (1999 Sep 24) 263 (2) 543-9.
Journal code: 0372516. ISSN: 0006-291X.

PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-AF176838; GENBANK-AF176839; GENBANK-AF176840; GENBANK-AF176841
ENTRY MONTH: 199910
ENTRY DATE: Entered STN: 19991101
Last Updated on STN: 19991101
Entered Medline: 19991021

AB Using the sequences of a galactose 6-O-sulfotransferase and an N-acetylglucosamine 6-O-sulfotransferase as probes in an EST approach, we have identified a highly related cDNA in **human** and an apparent orthologue in mouse. The cDNAs predict type II transmembrane proteins that constitute new members of the Gal/GalNAc/GlcNAc 6-O-sulfotransferase (**GST**) family. Members of this family have previously been implicated in the sulfation of GAG chains within proteoglycans and the sulfation of O-linked chains within sialomucin ligands for l-selectin. Expression of the newly identified cDNA in COS cells led to the addition of sulfate to C-6 of GlcNAc in an acceptor glycoprotein. The tissue expression of transcripts corresponding to the cDNA was highly restricted to the small intestine and colon in **humans**. Based on these characteristics, the novel sulfotransferase is designated I-GlcNAc6ST for intestinal GlcNAc 6-O-sulfotransferase.


```
=> e hemmerich s/au
E1          23     HEMMERICH RAINER/AU
E2           1     HEMMERICH ROLF H/AU
E3         113 --> HEMMERICH S/AU
E4          72     HEMMERICH STEFAN/AU
E5           2     HEMMERICH W/AU
E6           1     HEMMERICK GEO/AU
E7           1     HEMMERICK PETER/AU
E8           5     HEMMERLE A/AU
E9           9     HEMMERLE A V/AU
E10          3     HEMMERLE ANKE/AU
E11          9     HEMMERLE C/AU
E12          5     HEMMERLE CHRISTINE/AU

=> s e3
L23        113 "HEMMERICH S"/AU

=> d his

     (FILE 'HOME' ENTERED AT 14:45:53 ON 01 OCT 2002)

     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
     LIFESCI' ENTERED AT 14:46:13 ON 01 OCT 2002
L1           0 S GLYCOSUL (A)TRANSFERASE###
L2        2430 S GLYCOSYL (A)TRANSFERASE###
L3       45237 S GST###
L4       47661 S L2 OR L3
L5       20775 S (HUMAN OR MURINE ) AND L4
L6     5615033 S CLON? OR EXPRESS? OR RECOMBINANT
L7       11204 S L5 AND L6
L8        1697 S (HUMAN OR MURINE ) (A) L4
L9         845 S L8 AND L6
L10          0 S GST4(2W)ALPHA
L11    3576367 S ALPHA
L12        296 S L9 AND L11
L13         49 S "GST4"
L14          0 S "GST4ALPHA"
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L15             8 S L13 AND L12
L16             2 DUP REM L15 (6 DUPLICATES REMOVED)
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                  E ROSEN S/AU
L18          2288 S E3
L19             0 S L5 AND L18
                  E LEE J K L/AU
                  E LEE J K /AU
L20          3333 S E3
L21            17 S L5 AND L20
L22             6 DUP REM L21 (11 DUPLICATES REMOVED)
                  E HEMMERICH S/AU
L23           113 S E3

=> s l5 and l23
L24            15 L5 AND L23

=> dup rem l24
PROCESSING COMPLETED FOR L24
L25             6 DUP REM L24 (9 DUPLICATES REMOVED)

=> d 1-6 ibib ab

L25   ANSWER 1 OF 6  BIOTECHDS COPYRIGHT 2002 THOMSON DERWENT AND ISI
ACCESSION NUMBER: 2001-06117  BIOTECHDS
TITLE:            New glycosyl-sulfotransferases (GST)-4-alpha,
                  GST-4-beta and GST-6 for diagnostic and
                  therapeutic agent screening applications;
                     vector-mediated gene transfer, expression in host cell,
                     monoclonal antibody and transgenic animal for selectin
                     binding-inhibitor, drug screening and disease therapy,
                     diagnosis and gene therapy
AUTHOR:           Rosen S D; Lee J K; Hemmerich S
PATENT ASSIGNEE:  Univ.California
LOCATION:         Oakland, CA, USA.
PATENT INFO:      WO 2001006015 25 Jan 2001
APPLICATION INFO: WO 2000-US19741 19 Jul 2000
PRIORITY INFO:    US 2000-593828 13 Jul 2000; US 1999-144694 20 Jul 1999
DOCUMENT TYPE:    Patent
LANGUAGE:         English
OTHER SOURCE:     WPI: 2001-138471 [14]
AB    A glycosyl-sulfotransferase (GST) (I) selected from the group
      GST-4-alpha, GST-4-beta and GST-6, is
      claimed.  Also claimed are: a fragment of (I); a DNA (II) encoding (I); a
      DNA or its mimetic that hybridizes to (II) or its complementary sequence;
      an expression cassette (III) containing a transcriptional initiation
      region functional in an expression host and (II) under the
      transcriptional regulation of the transcriptional initiation region and a
      transcriptional termination region; a host cell (IV) containing (III);
      the cellular progeny of (IV); a method of producing (I); a monoclonal
      antibody that specifically binds to (I); and a non-human
      transgenic animal model for gene function, where the animal contains an
      introduced alteration in a gene encoding (I).  (I) is useful for
      inhibiting a binding event between a selectin and a selectin ligand,
      which involves contacting the selectin with a non-sulfated selectin
      ligand.  (II) encoding (I) is also useful in gene therapy to treat
      disorders such as acute or chronic inflammation and transplant tissue
      rejection and also for disease diagnosis.  (44pp)

L25  ANSWER 2 OF 6     MEDLINE                          DUPLICATE 1
ACCESSION NUMBER:   2001253103     MEDLINE
DOCUMENT NUMBER:    21250677   PubMed ID: 11352640
TITLE:              Sulfation of endothelial mucin by corneal keratan
                    N-acetylglucosamine 6-O-sulfotransferase (GST
```

-4beta).
AUTHOR: Bartes A; Bhakta S; **Hemmerich S**
CORPORATE SOURCE: Department of Respiratory Diseases, Roche Bioscience, 3401 Hillview Avenue, Palo Alto, California 94304, USA.
SOURCE: BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, (2001 Apr 13) 282 (4) 928-33.
Journal code: 0372516. ISSN: 0006-291X.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200106
ENTRY DATE: Entered STN: 20010611
Last Updated on STN: 20010611
Entered Medline: 20010607

AB Intestinal N-acetylglucosamine 6-O-sulfotransferase (I-GlcNAc6ST, **GST**-4alpha) and corneal N-acetylglucosamine 6-O-sulfotransferases (C-GlcNAc6ST, **GST**-4beta) are two highly homologous GlcNAc 6-O-sulfotransferase isozymes encoded by two intronless open reading frames that reside approximately 50 kb apart on **human** chromosome 16q23.1. I-GlcNAc6ST has been shown to catalyze 6-O-sulfation of the endothelial mucin GlyCAM-1. C-GlcNAc6ST catalyzes 6-O-sulfation of GlcNAc in keratan sulfate and null-mutations in its encoding gene cause **human** macular corneal dystrophy. We show here that C-GlcNAc6ST efficiently catalyzes sulfation of GlyCAM-1 when coexpressed with the latter in COS-7 cells. We have further compared expression in **human** of both enzymes by Northern analysis with isozyme-specific probes. While I-GlcNAc6T is expressed mostly in intestinal tissue, larger C-GlcNAc6ST transcripts are found predominantly in the brain. Copyright 2001 Academic Press.

L25 ANSWER 3 OF 6 MEDLINE DUPLICATE 2
ACCESSION NUMBER: 2001205848 MEDLINE
DOCUMENT NUMBER: 21096027 PubMed ID: 11181564
TITLE: Chromosomal localization and genomic organization for the galactose/ N-acetylgalactosamine/N-acetylglucosamine 6-O-sulfotransferase gene family.
AUTHOR: **Hemmerich S**; Lee J K; Bhakta S; Bistrup A; Ruddle N R; Rosen S D
CORPORATE SOURCE: Department of Respiratory Diseases, Roche Bioscience, Palo Alto, CA 94304, USA.
CONTRACT NUMBER: RO1GM5741 (NIGMS)
SOURCE: GLYCOBIOLOGY, (2001 Jan) 11 (1) 75-87.
Journal code: 9104124. ISSN: 0959-6658.
PUB. COUNTRY: England: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-AF176838; GENBANK-AF280086; GENBANK-AF280087; GENBANK-AF280088; GENBANK-AF280089; GENBANK-AI824100
ENTRY MONTH: 200106
ENTRY DATE: Entered STN: 20010611
Last Updated on STN: 20010611
Entered Medline: 20010607

AB The galactose/N-acetylgalactosamine/N-acetylglucosamine 6-O-sulfotransferases (**GSTs**) are a family of Golgi-resident enzymes that transfer sulfate from 3'phosphoadenosine 5'phospho-sulfate to the 6-hydroxyl group of galactose, N-acetylgalactosamine, or N-acetylglucosamine in nascent glycoproteins. These sulfation modifications are functionally important in settings as diverse as cartilage structure and lymphocyte homing. To date six members of this gene family have been described in **human** and in mouse. We have determined the chromosomal localization of these genes as well as their genomic organization. While the broadly expressed enzymes implicated in

proteoglycan biosynthesis are located on different chromosomes, the highly tissue specific enzymes **GST**-3 and 4 are encoded by genes located both in band q23.1--23.2 on chromosome 16. In the mouse, both genes reside in the syntenic region 8E1 on chromosome 8. This cross-species conserved clustering is suggestive of related functional roles for these genes. The **human GST4** locus actually contains two highly similar open reading frames (ORF) that are 50 kb apart and encode two highly similar enzyme isoforms termed **GST**-4 alpha and **GST**-4 beta. All genes except **GST0** (chondroitin 6-O-sulfotransferase) contain intron-less ORFs. With one exception these are fused directly to sequences encoding the 3' untranslated regions (UTR) of the respective mature mRNAs. The 5' UTRs of these mRNAs are usually encoded by a number of short exons 5' of the respective ORF. 5'UTRs of the same enzyme expressed in different cell types are sometimes derived from different exons located upstream of the ORF. The genomic organization of the **GSTs** resembles that of certain glycosyltransferase gene families.

L25 ANSWER 4 OF 6 MEDLINE DUPLICATE 3
ACCESSION NUMBER: 2001098512 MEDLINE
DOCUMENT NUMBER: 20568280 PubMed ID: 10956661
TITLE: Sulfation of N-acetylglucosamine by chondroitin 6-sulfotransferase 2 (**GST**-5).
AUTHOR: Bhakta S; Bartes A; Bowman K G; Kao W M; Polsky I; Lee J K; Cook B N; Bruehl R E; Rosen S D; Bertozzi C R; **Hemmerich S**
CORPORATE SOURCE: Department of Respiratory Diseases, Roche Bioscience, Palo Alto, California 94304, USA.
CONTRACT NUMBER: R37GM23547 (NIGMS)
R01GM5741 (NIGMS)
R01GM59907-01 (NIGMS)
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (2000 Dec 22) 275 (51) 40226-34.
Journal code: 2985121R. ISSN: 0021-9258.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-AF280089
ENTRY MONTH: 200102
ENTRY DATE: Entered STN: 20010322
Last Updated on STN: 20010322
Entered Medline: 20010201

AB Based on sequence homology with a previously cloned **human** GlcNAc 6-O-sulfotransferase, we have identified an open reading frame (ORF) encoding a novel member of the Gal/GalNAc/GlcNAc 6-O-sulfotransferase (**GST**) family termed **GST**-5 on the **human** X chromosome (band Xp11). **GST**-5 has recently been characterized as a novel GalNAc 6-O-sulfotransferase termed chondroitin 6-sulfotransferase-2 (Kitagawa, H., Fujita, M., Itio, N., and Sugahara K. (2000) J. Biol. Chem. 275, 21075-21080). We have coexpressed a **human GST**-5 cDNA with a GlyCAM-1/IgG fusion protein in COS-7 cells and observed four-fold enhanced [(35)S]sulfate incorporation into this mucin acceptor. All mucin-associated [(35)S]sulfate was incorporated as GlcNAc-6-sulfate or Galbeta1-->4GlcNAc-6-sulfate. **GST**-5 was also expressed in soluble epitope-tagged form and found to catalyze 6-O-sulfation of GlcNAc residues in synthetic acceptor structures. In particular, **GST**-5 was found to catalyze 6-O-sulfation of beta-benzyl GlcNAc but not alpha- or beta-benzyl GalNAc. In the mouse genome we have found a homologous ORF that predicts a novel **murine** GlcNAc 6-O-sulfotransferase with 88% identity to the **human** enzyme. This gene was mapped to mouse chromosome X at band XA3.1-3.2. **GST**-5 is the newest member of an emerging family of carbohydrate 6-O-sulfotransferases that includes chondroitin 6-sulfotransferase (**GST**-0), keratan-sulfate galactose

6-O-sulfotransferase (**GST**-1), the ubiquitously expressed GlcNAc
6-O-sulfotransferase (**GST**-2), high endothelial cell GlcNAc
6-O-sulfotransferase (**GST**-3), and intestinal GlcNAc
6-O-sulfotransferase (**GST**-4).

L25 ANSWER 5 OF 6 BIOTECHDS COPYRIGHT 2002 THOMSON DERWENT AND ISI
ACCESSION NUMBER: 2000-00104 BIOTECHDS
TITLE: **Human** and mouse glycosyl-sulfotransferase-3 and related polynucleotides;
expression in mammalian host cell and antibody, used for disease diagnosis and gene therapy
AUTHOR: Bistrup A; Rosen S D; Tangemann K; **Hemmerich S**
PATENT ASSIGNEE: Univ.California; Syntex
LOCATION: Oakland, CA, USA; Palo Alto, CA, USA.
PATENT INFO: WO 9949018 30 Sep 1999
APPLICATION INFO: WO 1999-US4316 26 Feb 1999
PRIORITY INFO: US 1998-190911 12 Nov 1998; US 1998-45284 20 Mar 1998
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: WPI: 1999-580442 [49]
AB Glycosyl-sulfotransferase-3 (**GST**-3, 386 or 388 amino acids) present in other than its natural environment, is new. Also claimed are: a nucleic acid (2,032 or 1,893 bp) which encodes **GST**-3; an expression cassette under the control of initiation sequences and termination sequences; a host cell; a method of producing **GST**-3; a monoclonal antibody; a method for inhibiting the binding of a selectin and a selectin ligand; a method of inhibiting a selectin mediated binding event in a mammalian host; a method of modulating a symptom of a disease condition associated with a selectin mediated binding event; a method of diagnosing a disease state related to the abnormal levels of a sulfotransferase chosen from **GST**-3 and KSGal6ST; a method of determining whether an agent is capable of modulating the activity of a sulfotransferase chosen from **GST**-3 and KSGal6ST; and a non-**human** transgenic animal model for **gst**-3 gene function. The nucleic acid sequences, DNA probes and DNA primers derived from these, proteins and antibodies are useful in detecting homologs. The products are useful in the diagnosis of diseases associated with selectin binding interactions. (59pp)

L25 ANSWER 6 OF 6 MEDLINE DUPLICATE 4
ACCESSION NUMBER: 1999423499 MEDLINE
DOCUMENT NUMBER: 99423499 PubMed ID: 10491328
TITLE: Cloning and characterization of a mammalian N-acetylglucosamine-6-sulfotransferase that is highly restricted to intestinal tissue.
AUTHOR: Lee J K; Bhakta S; Rosen S D; **Hemmerich S**
CORPORATE SOURCE: Department of Anatomy and Program in Immunology, University of California, San Francisco, California, 94143, USA.
CONTRACT NUMBER: R37GM23547 (NIGMS)
R01GM5741 (NIGMS)
SOURCE: BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, (1999 Sep 24) 263 (2) 543-9.
Journal code: 0372516. ISSN: 0006-291X.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-AF176838; GENBANK-AF176839; GENBANK-AF176840; GENBANK-AF176841
ENTRY MONTH: 199910
ENTRY DATE: Entered STN: 19991101
Last Updated on STN: 19991101
Entered Medline: 19991021
AB Using the sequences of a galactose 6-O-sulfotransferase and an

N-acetylglucosamine 6-O-sulfotransferase as probes in an EST approach, we have identified a highly related cDNA in **human** and an apparent orthologue in mouse. The cDNAs predict type II transmembrane proteins that constitute new members of the Gal/GalNAc/GlcNAc 6-O-sulfotransferase (**GST**) family. Members of this family have previously been implicated in the sulfation of GAG chains within proteoglycans and the sulfation of O-linked chains within sialomucin ligands for l-selectin. Expression of the newly identified cDNA in COS cells led to the addition of sulfate to C-6 of GlcNAc in an acceptor glycoprotein. The tissue expression of transcripts corresponding to the cDNA was highly restricted to the small intestine and colon in **humans**. Based on these characteristics, the novel sulfotransferase is designated I-GlcNAc6ST for intestinal GlcNAc 6-O-sulfotransferase.


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L1             0 S GLYCOSUL (A)TRANSFERASE###
L2          2430 S GLYCOSYL (A)TRANSFERASE###
L3         45237 S GST###
L4         47661 S L2 OR L3
L5         20775 S (HUMAN OR MURINE ) AND L4
L6       5615033 S CLON? OR EXPRESS? OR RECOMBINANT
L7         11204 S L5 AND L6
L8          1697 S (HUMAN OR MURINE ) (A) L4
L9           845 S L8 AND L6
L10            0 S GST4(2W)ALPHA
L11      3576367 S ALPHA
L12          296 S L9 AND L11
L13           49 S "GST4"
L14            0 S "GST4ALPHA"
L15            8 S L13 AND L12
L16            2 DUP REM L15 (6 DUPLICATES REMOVED)
L17           18 DUP REM L13 (31 DUPLICATES REMOVED)
                 E ROSEN S/AU
L18         2288 S E3
L19            0 S L5 AND L18
                 E LEE J K L/AU
                 E LEE J K /AU
L20         3333 S E3
L21           17 S L5 AND L20
L22            6 DUP REM L21 (11 DUPLICATES REMOVED)
                 E HEMMERICH S/AU
L23          113 S E3
L24           15 S L5 AND L23
L25            6 DUP REM L24 (9 DUPLICATES REMOVED)

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	Issue Date	Pages	Document ID ▽	Title
1	20000118	64	US 6015701 A	N-acetylglucosaminyltransferase V proteins and coding sequences

	Issue Date	Pages	Document ID ▽	Title
1	20020402	38	US 6365365 B1	Method of determining whether an agent modulates glycosyl sulfotransferase-3
2	20010724	27	US 6265192 B1	Glycosly sulfortransferase-3
3	20011213	27	US 20010051370 A1	Glycosyl sulfotransferase-3

	Document ID	Issue Date	Pages
1	US 20020076705 A1	20020620	214
2	US 20020032323 A1	20020314	64
3	US 20010051370 A1	20011213	27
4	US 6365365 B1	20020402	38
5	US 6265192 B1	20010724	27
6	US 5652343 A	19970729	35
7	US 5484891 A	19960116	35
8	US 5304640 A	19940419	37

	Issue Date	Pages	Document ID ▽	Title
1	20020402	38	US 6365365 B1	Method of determining whether an agent modulates glycosyl sulfotransferase-3
2	20011120	10	US 6319678 B1	Process for glucuronidation screening
3	20010731	27	US 6268484 B1	HIV-vaccines
4	20010724	27	US 6265192 B1	Glycosly sulfortransferase-3
5	20010123	28	US 6177256 B1	Antigen carbohydrate compounds and their use in immunotherapy
6	20000118	64	US 6015701 A	N-acetylglucosaminyltransferase V proteins and coding sequences
7	19991123	27	US 5989552 A	Antigen carbohydrate compounds and their use in immunotherapy
8	19990615	15	US 5911989 A	HIV-vaccines
9	19990216	37	US 5871950 A	Methods of treating autoimmune diseases and transplantation rejection

	Issue Date	Pages	Document ID ▽	Title
10	19970930	18	US 5672692 A	Purification of human myelomonocyte interferon gamma with an immobilized antibody
11	19970715	21	US 5648218 A	Preparation of photoprotein conjugates and methods of use thereof
12	19970211	41	US 5602003 A	N-acetylglucosaminyltransferase V gene
13	19960917	46	US 5556754 A	Methods for assessing the ability of a candidate drug to suppress MHC class I expression
14	19960910	20	US 5554515 A	Preparation of a monoclonal antibody specific to human myelomonocyte interferon-gamma
15	19960521	20	US 5518899 A	Preparation of human myelomonocyte interferon-gamma
16	19960123	15	US 5486455 A	Photoprotein conjugates and methods of use thereof
17	19941108	19	US 5362490 A	Human myelomonocyte interferon-gamma, and process for preparation and use thereof
18	19900717	6	US 4942131 A	Monoclonal antibody and method for preparation of hybridoma producing said antibody

	Issue Date	Pages	Document ID ▽	Title
1	20010605	20	US 6242478 B1	Five member ring sulfenate esters and thiosulfinate esters
2	20000815	20	US 6103665 A	Inhibition of glutathione transferase by haloenol lactones
3	19991019	81	US 5968737 A	Method of identifying inhibitors of glutathione S-transferase (GST) gene expression
4	19980616	22	US 5767147 A	Inhibition of glutathione transferase by haloenol lactones
5	19970826	23	US 5660986 A	Immortalized human cell lines containing exogenous cytochrome P450 genes
6	19960409	25	US 5506131 A	Immortalized human cell lines containing exogenous cytochrome P450 genes
7	20020411	16	US 20020042129 A1	Immortalized human skin cell lines and novel serum-free medium useful for the production thereof
8	20020131	17	US 20020012993 A1	IMPROVED IMMORTALIZED HUMAN SKIN CELL LINES AND NOVEL SERUM-FREE MEDIUM USEFUL FOR THE PRODUCTION THEREOF

	Issue Date	Pages	Document ID ▽	Title
19	19870707	7	US 4678747 A	Monoclonal antibodies for detection of an H (O) blood group antigen
20	20020926	14	US 20020137673 A1	Factor VII glycoforms
21	20020822		US 20020115628 A1	47169 and 33935, novel human glycosyl transferases and uses thereof
22	20020620		US 20020076740 A1	PROCESS FOR GLUCURONIDATION SCREENING
23	20020328		US 20020037850 A1	Novel polypeptides and nucleic acids encoding same
24	20011213		US 20010051370 A1	Glycosyl sulfotransferase-3
25	20011213	201	US 20010051335 A1	POLYNUCLEOTIDES AND POLYPEPTIDES DERIVED FROM CORN TASSEL

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1	20020402	38	US 6365365 B1	Method of determining whether an agent modulates glycosyl sulfotransferase-3
2	20010724	27	US 6265192 B1	Glycosly sulfortransferase-3
3	19970729	35	US 5652343 A	Method for purification of L-selectin ligands
4	19960116	35	US 5484891 A	Selectin ligands
5	19940419	37	US 5304640 A	DNA sequence encoding a selectin ligand
6	20020620	214	US 20020076705 A1	31 human secreted proteins
7	20020314	64	US 20020032323 A1	STREPTOCOCCUS PNEUMONIAE POLYNUCLEOTIDES AND SEQUENCES
8	20011213	27	US 20010051370 A1	Glycosyl sulfotransferase-3

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6	US 5767147 A	19980616	22	Inhibition of glutathione transferase by haloenol lactones
7	US 5660986 A	19970826	23	Immortalized human cell lines containing exogenous cytochrome P450 genes
8	US 5506131 A	19960409	25	Immortalized human cell lines containing exogenous cytochrome P450 genes

	L #	Hits	Search Text
1	L1	317	glycosyl adj transferase$5
2	L2	296105	human or murine
3	L3	46	l1 same l2
4	L4	457843	clon$3 or express$3 or recombinant
5	L5	25	l3 same l4
6	L6	8	"GST-alpha"
7	L7	1630	rosen.in.
8	L8	8	l1 and l7
9	L9	34880	lee.in.
10	L10	1	l3 and l9
11	L11	45	hemmerich.in.
12	L12	3	l1 and l11